

## Overview

### Useful For

Assessment of kidney failure (prerenal vs acute kidney injury)

### Method Name

Kinetic Ultraviolet Assay

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Ordering Guidance

A timed 24-hour urine collection is the preferred specimen for measuring and interpreting this urinary analyte. See URCR / Uric Acid, 24 Hour, Urine.

Random collections normalized to urinary creatinine may be of some clinical use in patients who cannot collect a 24-hour specimen, typically small children.

### Specimen Required

**Supplies:** Sarstedt 5 mL Aliquot Tube (T914)

**Container/Tube:** Plastic tube

**Specimen Volume:** 4 mL

#### Collection Instructions:

1. Collect a random urine specimen.
2. No preservative.

### Forms

If not ordering electronically, complete, print, and send a [Renal Diagnostics Test Request](#) (T830) with the specimen.

### Specimen Minimum Volume

1 mL

### Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

### Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Refrigerated (preferred)	14 days	
	Ambient	7 days	
	Frozen	30 days	

## Clinical & Interpretive

### Clinical Information

Urea is a low molecular weight substance (60 Da) that is freely filtered by glomeruli, and the majority is excreted into the urine, although variable amounts are reabsorbed along the nephron. It is the major end-product of protein metabolism in humans and other mammals. Approximately 50% of urinary solute excretion and 90% to 95% of total nitrogen excretion is composed of urea under normal conditions. Factors that tend to increase urea excretion include increases in glomerular filtration rate, increased dietary protein intake, protein catabolic conditions, and water diuretic states. Factors that reduce urea excretion include low protein intake and conditions that result in low urine output (eg, dehydration). Urea excretion is a useful marker of protein metabolism.

In oliguric patients with a rising creatinine a fractional excretion of urea below 35% is consistent with a prerenal cause, while values above 35% are more consistent with acute kidney injury.<sup>(1)</sup> The fractional excretion of sodium is also used for this purpose but may be more affected by diuretics. Therefore, the fractional excretion of urea may be particularly useful for patients receiving diuretics.

### Reference Values

No established reference values

Random urine urea may be interpreted in conjunction with serum urea, using both values to calculate fractional excretion of urea.

The calculation for fractional excretion (FE) of urea is  

$$FE(U) = \frac{[U(urine) \times Creat(serum)]}{[U(serum) \times Creat(urine)]} \times 100$$

### Interpretation

Fractional excretion of urea under 35% is consistent with a prerenal cause.

### Cautions

No significant cautionary statements

### Clinical Reference

1. Carvounis CP, Nisar S, Guro-Razuman S: Significance of the fractional excretion of urea in the differential diagnosis of acute renal failure, *Kidney Int.* 2002 Dec;62(6):2223-2229
2. Lamb EJ, Jones GRD: Kidney function tests. In: Rifai N, Horvath AR, Wittwer CT, eds: *Tietz Textbook of Clinical Chemistry and Molecular Diagnostics.* 6th ed. Elsevier; 2018:498-500
3. Bankir L, Trinh-Trang-Tan MM: Urea and the kidney. In: Brenner B, ed: *The kidney.* 6th ed. WB Saunders Company; 2000

## Performance

### Method Description

Urea is hydrolyzed by urease to form ammonia and carbon dioxide. The ammonia formed then reacts with ketoglutarate and reduced nicotinamide adenine dinucleotide (NADH) in the presence of glutamate dehydrogenase to yield glutamate and NAD(+). The decrease in absorbance is due to consumption of NADH as measured kinetically at 340 nm. (Package insert: Roche Urea/BUN. Roche Diagnostics; V 8.0 02/2020)

### PDF Report

No

### Day(s) Performed

Monday through Sunday

### Report Available

Same day/1 day to 24 days

### Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

## Fees & Codes

### Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact [Customer Service](#).

### Test Classification

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

### CPT Code Information

84540

### LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
URCON	Urea, Random, U	3092-4

Result ID	Test Result Name	Result LOINC® Value
URCON	Urea, Random, U	3092-4